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DFD-4973-59
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20 July 1959

MEMORANDUM TO: Col. Burke

SUBJECT : Trip Report of Visit to Edwards Air Force Base, California

1. On 16 July 1959, [redacted] visited the Edwards Air Force Base facility to discuss the progress of the J-75 engine program. Discussions were held with [redacted] and various pilots flying the U-2 equipped with the J-75. STAT STAT

2. The status of the J-75 engine test program can be summarized as follows:

A. FLYING TIME: As of 16 July 1959, the total flight test time was 258 hours. The Edwards facility is very optimistic about completing 400 test hours prior to 1 August 1959.

B. COMPRESSOR STALLS: One (1) of the two (2) major engine problems is that of compressor stalls during the climb to cruise altitude. To date it has not been resolved whether the stalls are caused by faulty fuel scheduling or inlet air flow. This problem can be circumvented by climbing from 40,000 feet to 60,000 feet using partial power. The problem does not exist at the higher or lower altitudes.

C. ENGINE OIL TEMPERATURE: The second major engine problem is that of excessive oil temperature during the cruise climb portion of the mission profile. After a climb to approximately 67,500 feet, a cruise climb mission profile can be flown until the altitude reaches about 72,500 feet. If the climb is continued to a higher altitude, the oil temperature becomes excessive. If the altitude is maintained, a decrease in oil temperature is noted. After approximately six (6) hours of a basic mission profile, not exceed 72,500 feet, it is possible to pull up to 75,000 and remain there for one (1) hour before the oil temperature becomes excessive.

D. ENGINE COMPONENT PARTS: To date, there have not been any component parts' failures. The special gear box for the d-c generator is performing satisfactorily and the only difficulty was caused by reusing an O-Ring with a previous permanent set.

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E. PRESSURIZATION: The pressurization of the Q Bay has not been adequate when the aircraft is flying at maximum altitude. The exact cause is not known. Lockheed is confident of being able to maintain the desired compartment pressure. If necessary, a nitrogen bottle will be employed to maintain the seal pressure.

F. CAMERA VIBRATION: No solution is in sight yet to reduce the camera vibration which is causing a serious degradation of photo resolution. A modified vibration mount was scheduled for test on 17 July 1959.

G. AUTOPILOT: Some improvement has been made in the autopilot. Additional testing will continue. Pilot comments indicate that it is impossible to adequately "hand fly" the airplane above 70,000 feet. The airplane flight envelope between stall and Mach buffet is extremely narrow and the manual pitch control is not sufficiently positive in this area which necessitates the use of the autopilot for mission success.

H. ENGINE FLAME OUT: Should the hydraulic system fail during flight, an immediate loss of the fuel boost pump is experienced. It is not known whether or not such boost pump failure will result in engine flame out. Flame out probably will occur. [redacted] expressed a desire for an electrical "back-up" to the boost pump. It should be noted, however, that the same system is used on the present -31 aircraft and has followed the concept of minimum weight-calculated risk. Due to past records, it would not appear that this is an area of critical concern. STAT

I. ALTITUDE AND RANGE: The altitude and range parameters are interrelated functions. No final data are available but the initial climb can be made to approximately 67,500 feet followed by a cruise climb to 72,500 feet. This altitude limit is imposed by oil temperature (See C. above). The present indications are that the range will be reduced approximately 600 nautical miles, and mission time will be a maximum of 7:30 hours to provide adequate fuel reserve.

3. For the purpose of accurate maintenance of flight records, it is suggested that the airplanes equipped with the J-75 engine be officially designated as the U-2A. This would permit an immediate screening of flight records to ascertain pilot qualifications in the J-75 engine type aircraft rather than relying on aircraft tail number. Such practice is standard in the Air Force, for example, F-86 A, D, E, F, and F-100A, C, and D. Such designations suitably describe the model and mission characteristics of the particular airplanes.

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